

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
5 February 2004 (05.02.2004)

PCT

(10) International Publication Number
WO 2004/011799 A1

(51) International Patent Classification⁷: F03D 1/04, 3/04, 11/04, 7/04

(74) Agents: VAN WESTENBRUGGE, Andries et al.; Nederlandsch Octrooibureau, Scheveningseweg 82, P.O Box 29720, NL-2502 LS The Hague (NL).

(21) International Application Number:

PCT/NL2003/000517

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 15 July 2003 (15.07.2003)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
1021078 15 July 2002 (15.07.2002) NL

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

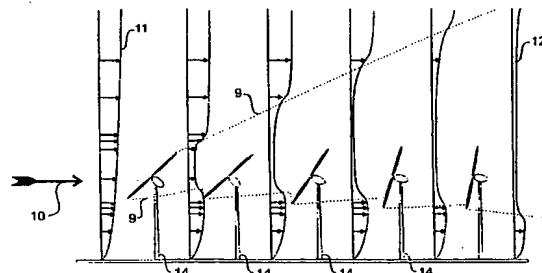
(71) Applicant (for US only): ENERGIEONDERZOEK CENTRUM PETTEN (ECN) [NL/NL]; 3 Westerduinweg, NL-1755 LE Petten (NL).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ASSEMBLY OF ENERGY FLOW COLLECTORS, SUCH AS WINDPARK, AND METHOD OF OPERATION



(57) Abstract: Method relating to an assembly by means of which energy can be extracted from a flowing fluid. It is proposed to regard all devices of the assembly together as one flow body. In particular those devices on the upstream side of the assembly are set such that they exert lateral (horizontal and/or vertical) forces on the fluid flow, as a result of which flows are produced that guide fast fluid through the energy-extracting devices and guide slow fluid precisely away from these in certain cases precisely the reverse is also advantageous). In particular this assembly comprises a wind farm and the devices that generate the lateral forces are a type of vortex generators for the atmospheric boundary layer, more particularly they are horizontal or vertical wind turbines positioned at an angle to the wind. By systematically setting the devices in accordance with certain patterns, the production can be increased in that, firstly, some of the slow air in the bottom part of the atmospheric boundary layer has already been guided away before the wind reaches the farm and, secondly, because slow wake air from energy-extracting devices is carried away by the circulations and is replaced by fast air from a greater height. A number of advantages are obtained by virtue of the invention. For instance, the fluid speed at the location of the energy-extracting devices is higher in many cases, as a result of which higher production is obtained. Furthermore, the energy-extracting devices are hindered to a lesser extent by wakes and they can therefore be placed closer to one another, as a result of which cable length is saved and the installed power per unit surface area can increase.

WO 2004/011799 A1